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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,948	01/07/2002	Yasuhide Noaki	0216-0462P	6243

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EXAMINER
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WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/019,948

Applicant(s)

NOAKI ET AL.

Examiner

Harry D Wilkins, III

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Applicant's admission of prior art in view of Kimura et al (US 5,571,390).

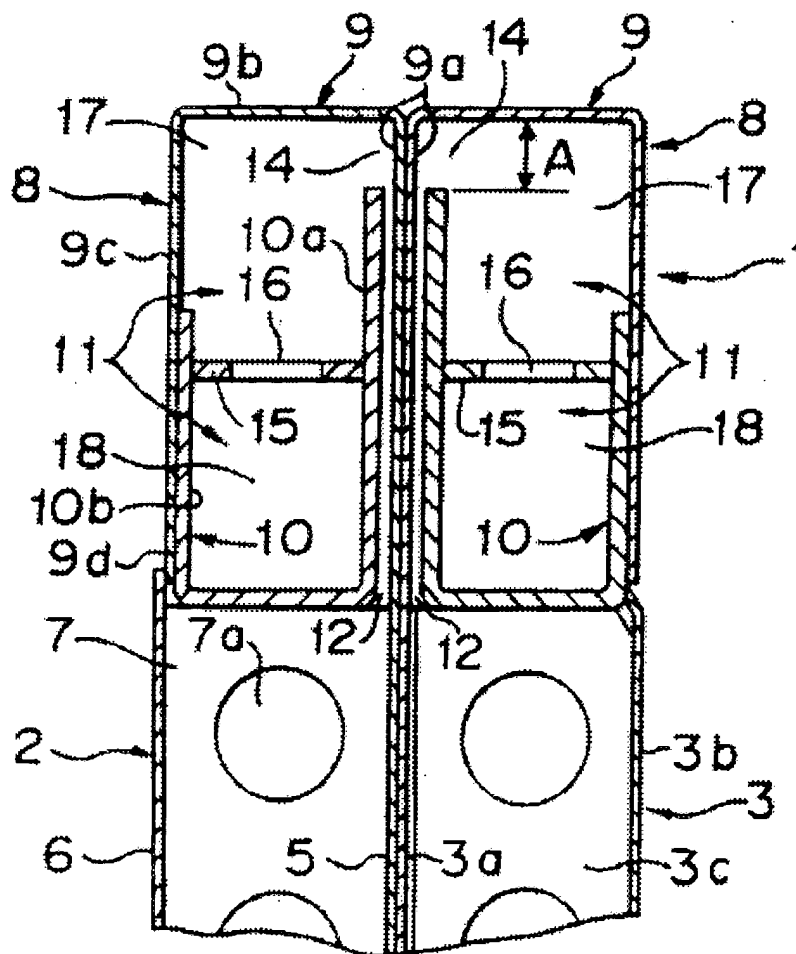
Applicant's admission of prior art in the preamble of this Jepson-type claim teaches the unit cell comprising a plurality of unit cells arranged in series through a cation exchange membrane including anode-side pan-shaped bodies, cathode-side pan-shaped bodies, anode -side gas-liquid separation chamber and cathode-side gas-liquid separation chamber as claimed.

Applicant's admission does not teach the improvement of a bubble removing partition wall disposed at least in the anode-side gas-liquid separation chamber which extends upwardly of the perforated bottom wall of the gas-liquid separation chamber.

Kimura et al teach (see figure 2 (reproduced below), abstract and description of figure 2 at col. 3, line 39 to col. 5, line 47) an anode-side gas-liquid separation chamber and a cathode-side gas-liquid separation chamber that includes a bubble removing partition wall (10a) extending upwardly from the bottom wall of the gas-liquid separation chamber for the purpose of reducing pressure fluctuations. The wall 10a extends along the entire length of the gas-liquid separation chamber and thus partitions the chamber

Art Unit: 1742

into a first passage A (located between wall 10a and walls 5 and 3a) and a second passage B (located between wall 10a and wall 10).



The partition wall 10a has an apertured segment at 14, which allows for communication between passage A and passage B. While Kimura et al fail to teach the height of the aperture, it would have been within the expected skill of a routineer in the art to have optimized the height of the wall to ensure proper minimization of pressure fluctuations.

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the partition wall of Kimura et al into the admitted apparatus because the partition wall of Kimura et al has the effect (see abstract) of reducing pressure

fluctuations thereby preventing the deterioration of the ion exchange membranes and reducing the voltage variation.

3. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admission of prior art in view of Kimura et al (US 5,571,390) as applied to claim 1 above, and further in view of Iacopetti et al (WO 98/55670).

The teachings of Applicant's admission in view of Kimura et al are described above in paragraph no. 2.

Applicant's admission in view of Kimura et al do not teach adding a baffle plate disposed in an upper portion of the anode compartment.

Iacopetti et al teach (see abstract and figure 4) an inclined baffle plate 7 that concentrates the gas bubbles produced below it and collapses many of the bubbles. The collapsing of the bubbles (described on pages 8 and 9) provides for easier separation of the liquid and gas phases. There is an upward flow on one side of the baffle plate and a downward flow on the opposite side.

Therefore, it would have been obvious to one of ordinary skill in the art to have added an inclined baffle as taught by Iacopetti et al to the apparatus of Applicant's admission in view of Kimura et al because the inclined baffle causes the gas bubbles produced to be collapsed thereby facilitating the separation of the gas and liquid phases.

Regarding claim 3, Iacopetti et al do not teach the size of the inclined baffle plate as claimed. However, it would have been within the expected skill of a routineer in the art to have optimized the size and positioning of the baffle plate in order to maximize the

Art Unit: 1742

ability of the plate to collapse the gas bubbles. The tilting of the baffle plate taught by Iacopetti et al includes, on the upward flow side, a wider gap at the bottom and a narrower gap at the top and on the downward flow side, a wider gap at the top and a narrower gap at the bottom.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admission of prior art in view of Kimura et al (US 5,571,390) as applied to claim 1 above, and further in view of Fuseya et al (US 4,295,953).

The teachings of Applicant's admission in view of Kimura et al are described above in paragraph no. 2.

Applicant's admission in view of Kimura et al do not teach adding an electrolytic solution distributor in at least the anode compartment.

Fuseya et al teach (see abstract (e) and figures 1-4) adding a pipe for the distribution of the electrolytic solution. The pipe is situated at the bottom of the anode compartment and has a plurality of holes and communicates with the solution inlet nozzle.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the pipe of Fuseya et al in the apparatus of Applicant's admission in view of Kimura et al because the distribution pipe of Fuseya et al provides for even distribution of the electrolyte across the entire electrode, thereby creating a more even electrolysis reaction.

However, Fuseya et al do not teach the size of the holes such that during the operation of the unit cell each feed hole exhibits a pressure loss of from 50 -1000 mm

Art Unit: 1742

H<sub>2</sub>O as claimed. Yet, it would have been within the expected skill of a routineer in the art to have adjusted the size of the feed holes and the feed pressure of the electrolyte feeding mechanism in order to ensure proper and even electrolyte feeding for the electrolysis reaction.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 10:00am-8:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw

ROY KING   
SUPERVISORY PATENT EXAMINER  
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